15¢ CHNOLOGY DEPARTMEN January 1, 1949

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Germ Warfare

See Page 4

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NUCLEAR PHYSICS-MEDICINE

Neutron Beam Injurious

Five radiation martyrs are going blind with cataract of the eye as a result of their work with the neutron beams of atom-smashing cyclotrons.

➤ THE HISTORY of scientific martyrdom is repeating itself. Five physicists are going blind because they looked unguardedly at the powerful neutron radiation from their atom smashers.

A half century ago when X-rays were new, other young and eager scientists also took chances with this novel radiation. Perhaps a half a hundred of them (a meticulous count 12 years ago listed 27 by name) suffered the serious and horribly painful X-ray burns which developed into cancer. First a finger was lost, then hands and arms and finally life.

Happily, those wounded by neutrons are not martyrs in the strict sense of the term which implies sacrifices of life as well as health for a cause. And medical science can restore eyesight to them through operation for cataract and proper eyeglasses, though it could not restore lost fingers and hands to the earlier radiation martyrs.

The physicists sacrificed their eyesight in pioneer work on the cyclotrons. They were fired by the same zeal to speed the benefits of their powerful new tool as led men and women of an earlier generation of Americans to sacrifice health and life in perfecting X-ray equipment and technique for diagnosing and treating human ills.

Like the X-ray martyrs, the physicists took a calculated risk with neutrons. As early as 1935, the neutron beam from a cyclotron was known to be more dangerous than an X-ray beam. It has been known since the early days of the Manhattan District work on the atomic bomb that neutrons are four to 10 times as dangerous as the same amount of X-rays. Yet the cyclotron pioneers used to watch for the violet-blue fluorescent beam of neutrons appearing. They deliberately looked into the beam either from necessity while making repairs to the machine or out of curiosity over this new and powerful tool.

Neutrons, the sub-atomic particles that cause the eye damage, are the triggers of the atomic bomb, operating the chain reaction. Because they are electrically neutral they are very penetrating. With protons, neutrons make up the hearts of all atoms. The lens of the eye is one of four tissues most sensitive to ionizing radiation, whether in the form of neutrons, X-rays or gamma rays from radium.

The other three are: 1. the white blood cells in the veins and arteries and bone marrow; 2. the male reproductive cells; 3. the cells lining the intestinal tract.

Even though the neutrons that caused cataracts in the lenses of the physicists' eyes must have hit other parts of their heads, the brain and other parts of the eye are very resistant to radiation so the men are not expected to suffer further damage.

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ENGINEERING

Cheaper Fuels from Coal

➤ CHEAPER gasoline and fuel oil from coal is promised by improved processes under development at the U. S. Bureau of Mines experimental and research laboratories in Bruceton, near Pittsburgh.

In these laboratories, a basically new approach to the problem of synthetic liquid fuel production by direct hydrogenation of coal is under investigation, the American Chemical Society was told by Dr. Henry H. Storch, chief of research at the institution. The method, he said, is a departure from the conventional Bergius process used by the Germans.

In this German process, coal dust is mixed with oil to form a paste. This is then treated with hot hydrogen under a pressure of more than 2,000 pounds per square inch. In the new process, Bureau chemists are trying to achieve better results by using moderate pressures and relatively high temperatures. Under these conditions considerable coal is turned to coke, but the coke can be recovered and used to furnish heat for the process.

In the new developments, relatively inexpensive water gas may replace the expensive hydrogen. The cost of compressed hydrogen constitutes about 50% of the total cost of liquid fuels prepared by hydrogenation of coal, he stated. Water gas, made by passing steam over white-hot coke, is the common manufactured gas used in many cities where natural gas is not available.

Laboratory experiments have disclosed that under appropriate operating conditions it is possible to replace pure hydrogen with the water gas, which is itself a mixture of hydrogen and carbon monoxide. Similarly, it is also possible to substitute for pure hydrogen the light, gaseous by-products of the hydrogenation process. Coal itself contains some available hydrogen which can be exploited by converting the coal to coke.

An entirely different process is also under study. In this the coal is dissolved before being treated with hydrogen. Research is now directed at determining the best solvent, and also at discovering suitable catalysts to speed the hydrogenation action under these conditions. This process is carried out at relatively low temperatures and pressures.

Science News Letter, January 1, 1949

Tech.

CHEMISTRY

New Repellent Protects Crops from Wild Animals

➤ HERE'S how to protect your bean crop from wild rabbits next spring, or from deer if you are in a deer country. Spray the foliage with a new chemical mixture which acts as a repellent to grazing animals after they chew a few leaves. Certain types of insects also are discouraged by the action of the chemical.

The new material is a development of the B. F. Goodrich Chemical Company of Cleveland, and was thoroughly tested by the Maine Fish and Game Department during the past year. Taste, not odor, is the big factor. It is not poisonous, but wild animals do not like its taste.

The compound is a vinyl resin. One application is sufficient until new leaf growth occurs. It can be used to protect other plants besides beans, and repels other animals besides rabbits and deer.

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ZOOLOGY

Mice Found Unadventurous —Unless Grub Supply Fails

➤ MICE are conservative home-bodies. As long as they have an assured food supply they will stick close by it, never venturing more than 30 or 40 feet away in any direction. Rats are pretty much the same, except that they will travel as much as 100 feet from their base of supplies.

These are among the facts of rodent life which scientists at the University of Wisconsin have been discovering, in an intensive research program headed up by Prof. John T. Emlen. With him are working four graduate students: Harold Young, Robert Strecker, James Beer and Fred Greeley. They keep track of the movements of rats and mice by trapping them, marking them and turning them loose again.

Among the practical aspects of their research is the discovery that the ordinary snap trap is a more efficient means for controlling mouse populations than any poison now known. One sure way to send mice and rats scurrying in search of new feeding grounds is to put a really good hunting cat to work on the premises.

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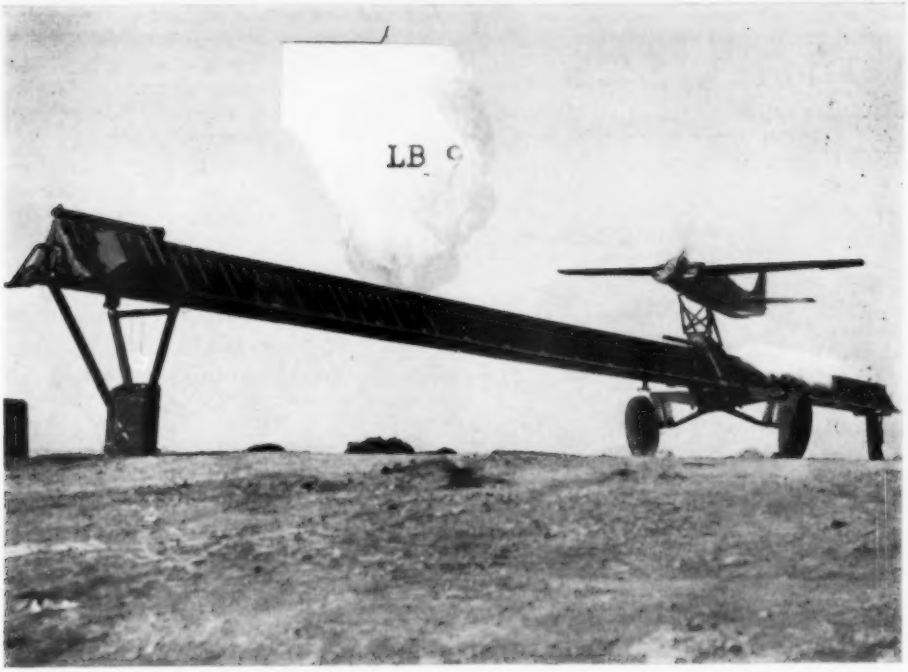

REMOTELY-CONTROLLED TARGET PLANE—The OQ-19A is shown taxiing along its ramp for takeoff. It has a speed of 220 miles an hour and weighs approximately 300 pounds. The target plane will be used for aircraft, anti-aircraft and flexible gunnery practice. Remotely controlled from ground or air, the puppet plane is capable of high speed dives, loops, barrel rolls, wing overs and steep banks. It will fly for 60 minutes without refueling.

MEDICINE

Test Blood for Cancer

Detection of this disease may be aided by a test reported to spot cancer in 75% of the cases. It reveals the ability of a chemical in blood to digest protein.

➤ DOCTORS and cancer research workers will be asking: "Do we at last have a blood test for cancer?"

Three Yale University School of Medicine scientists are reporting such a test that spots cancer in 75% of the cases. It may prove valuable in detecting cancer before it shows clinical signs, just as X-ray photographs can discover early tuberculosis.

The test developed by Drs. Donald G. C. Clark, Eugene E. Clifton and Berne L. Newton is actually one that tells whether the serum in human blood stops the ability of a body chemical (an enzyme like trypsin) to digest protein.

The relation of this anti-enzyme activity of the blood to the presence of cancer is so close that all patients who show consistently high anti-enzyme activity by the test should have "extremely careful observation," the scientists state in a report to the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE (Nov.).

In patients with cancer 75% gave a positive test. The test results were doubtful in 18% of the cancer patients and negative in only 7%.

In patients with tumors that were not malignant, there were no positive reactions, 25% doubtful ones and 75% negative ones.

Among apparently healthy persons there were only 2% positive tests, 17% doubtful ones and 81% negative.

The test was 90% successful in detecting cancer in patients who had recurrences after treatment.

The 7% of cancer patients in whom the test failed were all patients with either: 1. tumors of borderline malignancy, or 2. very small cancers or 3. extensive last stages of cancer or rapidly spreading cancer.

Further study, the scientists hope, will lead to a more specific test for cancer but meanwhile they feel the test is better for finding patients needing more detailed examination than the usual screening procedures at cancer detection clinics.

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MEDICINE

Scare Over Fits May Lead To New Facts About Brain

➤ DUE TO the scare over convulsions in dogs caused by a flour-bleaching agent, agene, now abandoned, we may learn more about how the brain and nervous system operate and the fundamental mechanisms of convulsions.

Brain wave studies pointing to this were reported by Dr. Maurice L. Silver of the Johns Hopkins Hospital, Baltimore, in the journal, SCIENCE (Dec. 17).

Brain wave patterns for convulsions caused by agenized proteins of wheat, corn and milk are characteristic and significantly different from the patterns produced by other convulsion-causing drugs, such as Metrazol or strychnine. Agene convulsions, like those of DDT, are unique, Dr. Silver pointed out.

The agene convulsions start in the cerebellum and apparently this part of the brain then "drives" the cerebral cortex, or thinking part of the brain, into convulsions.

"Somewhat surprising" also was the discovery that a dog on a bleached diet for three days will have a convulsion after inhaling a mixture of 20% carbon dioxide and 80% oxygen. Carbon dioxide, Dr. Silver points out, is known to have a depressant effect, on both the cerebral and cerebellar cortex.

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INVENTION

Invention Makes Car Put On Own Anti-Skid Cleats

➤ TIRED of putting on tire chains with half-frozen fingers? Relief from this wearing winter chore is promised by a pair of San Francisco inventors, Dola F. Miller and Frank Puslecki. They have devised a set of anti-skid cleats that are carried alongside the wheels at all times—and the wheels themselves have to do the work of attaching and removing them.

These cleats consist of flexible steel fingers covered with blocks of rubber. When not in use, they are housed in radial grooves in a disk on the inner side of the wheel. A second disk, with a spiral groove, engages the inner ends of these fingers when pressed against them, and as the wheel slowly turns moves the fingers out and over the tire. The disk is operated from the driver's seat by suitable lever-and-rod connections.

Once the anti-skid cleats are in position, the pressure of the spiral-grooved disk is eased, and the car is free to move ahead at a safe winter speed. When the going becomes better again, the disk is again pressed against the cleat ends, but the car is slowly backed this time, and the reversal of movement causes the withdrawal of the cleats.

U. S. patent 2,456,438 has been issued on this device.

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CHEMISTRY

New Fluorocarbon Uses

➤ A RELATIVELY new family of organic chemical compounds known as fluorocarbons promises to have many important industrial applications in the future, ranging from combustion-resistant hydraulic fluids for airplanes to anesthetics, insecticides and germicides.

One important application will be as lubricants of unprecedented stability, for example an oil so stable that it will permit construction of engines hitherto impossible because no known lubricant could withstand their pressure and friction. Another important application is a new plastic extremely resistant to chemical reaction in which a derivative of fluorocarbons is employed.

Fluorocarbons are similar to the hydrocarbons of petroleum, but differ in that all the hydrogen is replaced by fluorine. The hydrogen is the point of chemical attack in the hydrocarbons. The absence of hydrogen in the fluorocarbons gives them extraordinary chemical inertness.

Difficulties in the manufacturing of fluorocarbons are responsible for delays in their production and application. Making them from free fluorine is dangerous because fluorine is the most active of all chemical elements. Now they are being made by a new electro-chemical process which entails no use of free fluorine.

This is being done by the Minnesota Mining and Manufacturing Company of St. Paul, but as yet only in a pilot plant. It is producing fluorocarbons in the form of solids, liquids and gases. Synthetic production is necessary because there is no natural source of fluorocarbons corresponding to petroleum and coal for hydrocarbons.

A chemically-inert plastic based on a fluorocarbon is produced by the M. W. Kellogg Company of Jersey City. The compound used is trifluorochloroethylene, or actually a polymer of this compound in which many molecules are linked together to form giant molecules. The plastic is an unusually stable, high-temperature material of the thermoplastic type which is not brittle although strong and hard, and gives satisfactory performance at low temperatures as well as at relatively high heat.

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On This Week's Cover

➤ A BACTERIAL cell, magnified 34,800 times by the electron microscope at the University of Wisconsin, is shown being attacked by virus particles, seen as irregular lumps on the edges of the cell. The white dots throughout the photograph are also virus particles.

Known as *Clostridium Madisonii*, it is the first bacteria species to be named after Madison, Wis., where it was isolated from soil in a University garden. It has been put to work by the acetone and butyl alcohol producing industry for it is less apt to be destroyed by virus than other fermentation bacteria.

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ENGINEERING

New Tank Engines Are Small But Powerful

➤ SMALL in size but large in power, a new type air-cooled engine for Army tanks is to be built in quantities for the government, it is now revealed. It is a 12-cylinder V-type model, built to use 80 octane gasoline, and rated at 810 horsepower without supercharger and 1,040 horsepower with this air-compressor device.

An initial $18,800,000 order for these engines has just been placed by the Army with Continental Motors Corp., Detroit. The 12-cylinder type to be built is one of six basic air-cooled engine models which Continental has developed for the Army. The engines will be constructed at Muskegan, Mich., in a Continental plant, and a government-owned factory.

The placement of this large government order is a movement by the Army to put into effect its engine standardization program. This will permit the interchange of parts on a broad scale and thus simplify field services and maintenance problems.

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Italy, during the first seven months of 1948, exported over 6,500 passenger cars and 2,700 other automotive vehicles.

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Photographs: Cover, University of Wisconsin; p. 3, USAF Air Materiel Command; p. 5, Westinghouse Electric Corp.; p. 7, Stanolind Oil and Gas Co.; p. 10, Harvard University; p. 11, General Electric Co.

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MEDICINE

Surgery for 10 Heart Ills

Development of life-saving operations holds out hope for patients with heart conditions which might otherwise have proved fatal.

➤ PATIENTS suffering any of 10 diseases of the heart and great blood vessels now have a chance of being restored to health by surgical operations.

The life-saving operations, which include the "blue baby" one, have been developed by a number of surgeons in the United States and abroad. They are being reviewed for doctors, with suggestions for further use of surgery in heart conditions, by Dr. B. Noland Carter of Cincinnati in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 25). As listed by Dr. Carter the 10 are:

1. Acute suppurative pericarditis, an inflammation of the heart sac with pus often collecting in a groove behind the heart. Without surgery this is 100% fatal, but about half the patients treated by surgical drainage recover. Use of sulfa drugs and penicillin should save even more, chiefly by preventing the condition from developing.

2. Chronic constrictive pericarditis. Removal of part of the thickened, constricting sac around the heart cures or decidedly improves 61.5% of the patients. The disease always kills unless an operation is done.

3. Coronary sclerosis. This is the great killer, responsible for the "vast majority of deaths due to heart disease," Dr. Carter points out. The condition results from reduced flow of blood through the arteries supplying the heart muscle itself. Since 1935 various surgical procedures have been developed to increase the blood supply to the heart by a relinking of healthy blood vessels. Good results in as high as 70% of patients with only a 15.8% mortality have been reported. Dr. Carter urges more research and more use of surgery in this condition.

4. Nonpenetrating wounds of the heart. These come from direct blows over the heart from fists, baseball clubs and in "steering wheel accidents" and from compression by trailer bars, tail gates of trucks and the like. If there is a small rupture of the heart muscle and acute compression of the heart from accumulation of blood, surgery to remove the clots and blood and sew up the tear can be life-saving.

5. Penetrating wounds of the heart. Before 1933, 90% of the patients with gunshot, knife or other wounds of the heart died. Death rates have been reduced to from 22% to 49% and show signs of dropping still more.

6. Retained foreign bodies. World War II gave "one of the most thrilling and spectacular advances in heart surgery" through experiences in removing shell fragments and the like from the heart chambers and the inside of nearby great blood vessels. From this surgeons learned they can and should remove any foreign body measuring four-tenths of an inch (1 cm) in two directions.

7. Patent ductus arteriosus. In this condition the connection, present before birth, between the main artery from the heart and the main lung artery, fails to close at birth. Most victims die before they are 30 years old. Reports on operations to correct the condition show survival of 40 out of 43 patients, 88 out of 90, 59 out of 61.

8. Coarctation of the aorta, a constriction of the main artery leading from the heart. The operation consists essentially of cutting out the constricted part and rejoining the cut ends.

9. Tetralogy of Fallot. That is the medical name for the congenital heart condition relieved by the famous "blue baby" operation.

10. Aortic ring. This is a general term for defects of the main artery which can produce troublesome and sometimes fatal compression of the windpipe or the gullet. Cures in two patients, the first and only operated ones so far reported, were obtained by dividing the constricting ring at appropriate points to relieve the pressure.

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ENGINEERING

Twist Detector Reveals Tiny Changes in Metal

➤ A TWIST in a steel bar of less than one-millionth of an inch can now be measured. A new twist detector, revealed by Westinghouse, can detect changes in weight as small as one part in 100,000.

This new twist detector, a machine that measures weight by the twist the object gives to a metal bar, is technically an elastic-drift device. It is a supersensitive machine designed to aid in the development of more accurate torquemeters to measure rotation. These torquemeters are used to measure power delivered by airplane propellers, jet engines and other rotating machines.

Torquemeters are very accurate weighing devices in which a metal shaft replaces the springs in ordinary scales. The twist of the shaft becomes a measure of the weight applied. It can be detected electrically or magnetically and transmitted to meters for easy reading.

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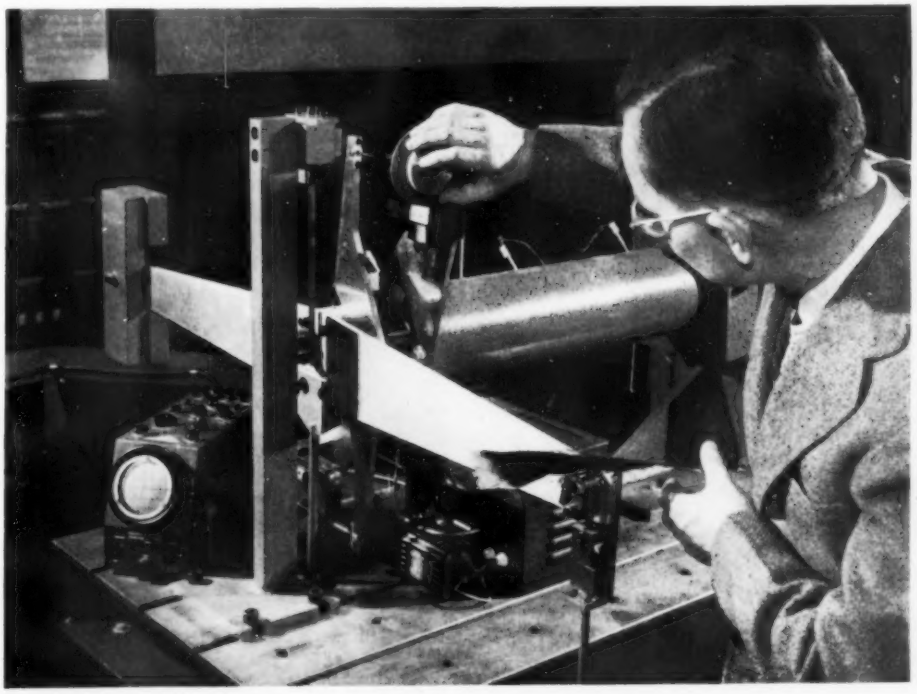
The use of *electric razors* during peak radio listening hours would be curtailed in proposed legislation reported from England.



SUPERSENSITIVE TWIST DETECTOR—A feather exerts enough force on the crossarm of this machine to twist the steel bar running perpendicular to it.

BOTANY

Algae May Avert Famine

➤ THE teeming world population of the twenty-first century, which some scientists already prophesy will be in a state of constant famine, may possibly escape this doom by learning to live on a plant that multiplies even faster than mankind's most prolific races. This possibility is held out as a speculative hope by two botanists of the Carnegie Institution of Washington, Drs. H. A. Spoehr and Harold W. Milner.

The plant is the microscopic freshwater alga known as Chlorella. Its whole body consists of a single globular cell containing a cup-shaped bit of chlorophyll wherewith it captures sunlight energy to use in compounding foods out of inorganic raw materials which it gets from the water. It reproduces simply by dividing into two parts, both of which grow up to the original size and then divide again. As long as water, sunlight and the raw materials for food manufacture hold out, it can do this several times every day. Theoretically it could swamp the whole world with its growth, but limiting factors always intervene to keep it under control.

Drs. Spoehr and Milner have discovered that they can make Chlorella produce high yields of either protein or fat at will, by manipulating its environment and mineral supply. Under such controls it can produce as much as half its dry weight as protein, or up to three-fourths its weight as fat. Their calculations indicate that a maximum of 1,390 pounds of fat might be produced in a growing season by an acre of water surface in Chlorella, as against 227 pounds of soybean oil or 360 pounds of peanut oil on an acre of land.

These figures are of course as yet wholly theoretical, for mass production of Chlorella has not so far been undertaken on even a pilot-plant scale. However, the two researchers have given some thought to the engineering problems involved, weighing possible advantages of growing the plant in glass tubes as against spreading it out in three-inch-deep tanks. They take into account also the age-old conservatism of both producers and consumers of foods, as well as possible difficulties of processing the dried Chlorella masses into products palatable either to human beings or to domestic animals that might translate the alga into terms of meat and milk.

Nevertheless, the possibility cannot be dismissed as mere speculation. Already, mass culturing of yeasts for feeding livestock has become economic in some parts of the world, and there are projects afoot that may make this culture a large-scale success in our own country. And whereas yeasts must be supplied with ready-made carbohydrate foods, as well as the necessary mineral salts, Chlorella needs only the latter and can manufacture its own basal carbohydrate foodstuffs.

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AERONAUTICS

Plane Stall-Proof System

➤ AN AIRPLANE with an automatic stall-proof system, which is capable of flying in all sorts of weather, was demonstrated by the U. S. Navy. The same equipment makes it possible for the plane to make instrument landings, following a radio glide path beam down to the runway.

Stall is a dangerous condition encountered in flight when the plane's angle of attack is so increased that the airflow leaves the under surface of the wings and forms a turbulent wake. The angle of attack is the angle between the plane of the airfoil and the apparent direction of the wind flowing over the airfoil or wing.

This stall-proof system is a joint development of the Office of Naval Research and the Minneapolis-Honeywell Regulator Company. It is called an angle-of-attack automatic-pilot. Its unique advantage is that the power to the engines is controlled by an element which is sensitive to the angle of attack of the plane.

The control surfaces are automatically operated in a manner not particularly different from that of a conventional autopilot in that gyroscopes provide the initial sensing of roll and pitch. This angle-of-attack control makes use of the fact that the stalling of an airplane is dependent not on its airspeed but on its angle of attack, which is in turn dependent on the shape of the airfoil. Being sensitive to the airplane's angle of attack, which determines its stall point, this device is said to provide virtually fool-proof stall characteristics, regardless of whether the plane is climbing or turning.

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WILDLIFE

Egg-Laying Ant-Eaters Brought from Australia

➤ EGG-LAYING mammals related to the duck-billed platypus, that feed on insects like ant-eaters and have protective armor of spines like porcupines, are among the rare specimens brought back to the American Museum of Natural History in New York from the "Never-Never Land" of northern Australia by the newly-returned 1948 Archbold Cape York Expedition. The creatures are sometimes called spiny ant-eaters, though they belong to a different, much more primitive animal group than the true ant-eaters.

Another great prize is one specimen of a kangaroo that lives in the treetops like a monkey. It was shot down by a member of the expedition during the last month in the field.

In addition to the many hundreds of animal specimens, the expedition brought back 11,600 sheets of pressed plants of the Cape York region. These will be deposited with the Arnold Arboretum of Harvard University.

Special studies of the life forms on northward-jutting Cape York are being made because of the light they are expected to shed on the connection, ages ago, between northern Australia and southern New Guinea. Kangaroos and related animals in New Guinea are believed to have migrated along a land bridge that once joined the two land masses, while some of the plants of the Cape York region are apparently of New Guinea origin.

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GEOLOGY

Uranium-Containing Mud In Fjords of Norway

➤ URANIUM-containing black mud can be dredged up from the bottoms of some of the fjords that cut deeply into the coast of Norway, states Dr. Kaare M. Strom of the University of Oslo in a communication to the editor of the British scientific journal, NATURE (Dec. 11).

The atomic-energy element, however, is not present in high enough concentration to justify scooping out the mud and working it as an ore. It is of interest primarily as a possible means of determining under what geologic conditions the uranium-containing black shales now found in the Norway hills may have been formed, perhaps half a billion years ago.

Uranium concentrations in present-day fjord-bottom muds range from 13 to 60 grams per metric ton, Dr. Strom's analyses show. This is roughly equivalent to a range of from one-half ounce to two ounces per English long ton of 2240 pounds. This is far below present levels for workable uranium ores; the U. S. Atomic Energy Commission will purchase such ores only when they contain more than two pounds of uranium oxide per ton.

As having possible bearing on the question of the origin of uranium-containing shales, Dr. Strom points out that the highest concentrations are in the blackest of the fjord-bottom muds, which come from situations where little oxygen penetrates and where only bacteria of the anerobic, or "airless", type can thrive. Well-ventilated muds, inhabited by air-using bacteria, are lighter in color and lower in uranium content.

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PSYCHOLOGY

American Drinking Habits

The way we spend our leisure time determines the pattern of our drinking, study shows. The cocktail party is an American development.

➤ AMERICAN drinking is different than that of other nations, and the whole pattern of how we spend our leisure time is what makes it different, a sociologist has concluded.

Things like the pressure to wait for "next week's installment," to take a speedy auto trip on Sunday and the Hollywood "Supercolossal Production" are a part of this pattern. That is the finding of Prof. Herbert A. Bloch of St. Lawrence University, Canton, N. Y., writing in the journal, THE AMERICAN SCHOLAR (winter, 1948-1949).

There is hope that medical science can help the pathological or extreme drinker, but Mr. Bloch believes that most Americans will have their alcohol drinking habits altered only by changing their idea of how to spend their leisure time.

Restless excitement and craving for a change are American characteristics that have frequently been pointed out by Europeans, Dr. Bloch explains. He finds that this applies to American drinking habits as well as other features of our life.

The American, he says, drinks "with far greater intensity and zeal" than other national groups. The cocktail party is an American development, the sociologist points out. The cocktail, he notes, "employing as its base relatively inexpensive and low-grade gins, is relished in the spirit of the time-honored American vernacularism, because 'it gets you there quicker'."

Phrases used in connection with drinking in this country reveal the American zeal in drinking, Dr. Bloch says. He cites the cry to "catch up," heard by late-comers, as an example. Others include "Here's mud in your eye!" and "Down the hatch!" Dr. Bloch contrasts this approach to drinking with the Frenchman who sits all evening with his aperitif.

Another characteristic of American drinking is the relatively high percentage of drinks with concentrated alcoholic content, such as whiskey and gin, contrasted with beer or wines.

Behind these differences in the way Americans and other peoples drink lie the tensions of our lives, Dr. Bloch suggests. Because our drinking habits are a part of the recreational pattern, he foresees no immediate success for reformers or any other efforts to change American drinking.

It might be changed, though, by working with what the American means by "having a good time," the sociologist urges.

Science News Letter, January 1, 1949

OIL-BEARING ROCKS—Core samples of rocks are placed in this Cinematome machine, then a diamond wheel grinds off a thin layer of the rock. A single frame picture is then taken of the rock face on colored motion picture film which will reveal to investigators the action of oil as it moves through underground rock formations.

AGRICULTURE

Flight Air Pressure Found Harmless to Vegetables

➤ AIR-BORNE fresh fruits and vegetables stay fresh despite the sudden changes in air pressure involved in flying them to distant markets.

Tests made by the U. S. Department of Agriculture and the Lockheed Aircraft Corporation of Burbank, Calif., in Lockheed's altitude chamber showed that if the temperature and humidity are controlled in flight, altitude changes do not damage the 34 different fruits and vegetables used in the experiments.

Science News Letter, January 1, 1949

ENGINEERING

Camera-Grinder Machine Reveals Porosity of Rock

➤ A CAMERA and a grinder with a diamond grinding wheel give promise of helping the oil industry study rock from deep under the surface of the earth to find answers to the problem of how to get more oil out of the ground.

The combination is called a cinematome machine. With it, motion picture "tours" through the insides of the rock are taken. The rocks examined are samples of cores brought to the surface from drill holes. The pictures show their porosity. The grinder can cut slices of rock so thin that it would take 30 of them to be as thick as a newspaper page.

Most oil deposits are found in porous rock formation thousands of feet underground. But the oil can be produced only if there are enough tiny holes in the rocks, connected so that oil droplets may move through to the well bore. This device is adding to scientists' knowledge of rock and how oil moves through porous formation. It is expected to aid in the development of better ways of increasing oil-flow to the wells.

The cinematome is a development of Stanolind Oil and Gas Company of Tulsa, Okla., by Henry Schaefer of the company's production research department. The feeding of the rock into the grinder is automatic. With the help of an electric motor, the rock layer shaved away passes from the grinder into place in front of the camera. When its picture is taken on a motion picture film, it makes way for another sample.

Science News Letter, January 1, 1949

MEDICINE

$21,000 Award Shared by Outstanding Researchers

➤ STREPTOMYCIN, cancer detection and treatment, an artificial kidney and sex hormone research shared honors in distribution of the $21,000 Amory prize money awarded by the American Academy of Arts and Sciences in Boston.

The Amory prizes are given every seven years for research in disorders of reproduction in accordance with the terms of a bequest of Francis Amory of Boston who died in 1912.

The awards this year go to:

Dr. W. J. Kolff of Holland for his artificial kidney, developed during the war in spite of difficulties created by the Nazis and lack of funds.

Prof. Selman A. Waksman of Rutgers University for discovery of streptomycin.

Dr. George N. Papanicolaou of Cornell University for research on sex hormones and discovery that cancer can be diagnosed early in some of its forms by detection in body secretions of malignant cells shed from the cancer.

Prof. Guy F. Marrian of Edinburgh, Scotland, for outstanding research in the chemistry of sex hormones.

Dr. Alexander B. Gutman of Presbyterian Hospital, New York, for work with his late wife, Ethel Gutman, leading to development of the acid phosphatase blood test for detecting cancer of the prostate gland.

Dr. Charles B. Huggins of the University of Chicago for discovering that cancers of the prostate depend for their existence on the male sex hormone. From this has come treatment for prostate gland cancer with good results in about 90% of the cases, and beneficial use of sex hormones in treatment of some patients, men and women, with breast cancer.

Science News Letter, January 1, 1949

GENERAL SCIENCE

German Scientists in West Envy Those Under Soviets

➤ WHILE the Soviet Union is recruiting German scientists and giving them "every encouragement," western zone German scientists are handicapped by confusion and lack of funds and facilities, a former State Department official said.

Most German scientists in the West envy their fellows in the Soviet-controlled areas, Julius C. C. Edelstein, former special advisor to the Secretary of State on reparations, declared in PHYSICS TODAY (Dec.), published by the American Institute of Physics.

Scientists in the American zone have been split into two groups under different jurisdictions. University scientists are in one group, while industrial scientists are in another.

"Research projects must be approved by Military Government officials whose understanding of science is not excessive," Mr. Edelstein commented. He added that a major prewar research institution in the American zone is now an officers' club.

British officials show more concern about the status of scientists in their areas, but, in general, Mr. Edelstein found "a sense of envy of the relatively privileged position of German scientists in the Soviet zone" among those in the West.

German scientific skills in the West are being wasted, while the Soviet rehabilitates German science in the East for its own purposes, the former reparations official charged.

"Every encouragement should certainly be given to scientists in Germany who can contribute to German economic recovery," Mr. Edelstein contended, "subject, of course, to those controls which should be exercised over insurgent and resurgent German nationalism."

But a real solution to the problem of German science, he concluded, will come only when other issues are solved.

Science News Letter, January 1, 1949

MEDICINE

Aureomycin Best Drug for Severe Undulant Fever

➤ AUREOMYCIN, one of the newest antigerm remedies from a mold, has proved to be the best drug so far available for the malignant form of undulant fever acquired from goats.

Prompt improvement in every one of 24 patients after getting the golden yellow mold drug is reported by Drs. Wesley W. Spink and Abraham I. Braude of the University of Minnesota Hospitals and Medical School and Drs. M. Ruiz Castaneda and Roberto Sylva Goytia of the Mexico General Hospital, Mexico City, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 18).

A combination of streptomycin and sulfadiazine had previously proved effective in treatment of undulant fever in the United States. But when tried in Mexico, where thousands of persons are victims of the disease, the sulfa drug-streptomycin combination did not work so well. In the Mexican patients the disease was caused by a different strain of undulant fever germs, *Brucella melitensis,* which are much more malignant than the *Brucella abortus* germs, against which the sulfa-streptomycin treatment was effective. The streptomycin-sulfadiazine treatment has also the disadvantage that it must be given in a hospital, since the streptomycin must be given by hypodermic injection.

Aureomycin can be given by mouth. Patients can take it at home without being in bed. It causes only slight side-effects, whereas streptomycin in large doses causes disturbance of the balancing mechanism in the ear and even deafness.

Science News Letter, January 1, 1949

IN SCIEN

ENTOMOLOGY-BIOCHEMISTRY

Antibacterial Compound Found in Insect Blood

➤ NEWEST source of germ-stopping compounds: insects. A substance that checks the multiplication of the germ that causes common boils and one type of food poisoning, Staphylococcus aureus, has been found in the blood of the large milkweed bug by Drs. Hubert Frings, Edith Goldberg and J. Caroline Arentzen of Pennsylvania State College. Reporting their discovery in SCIENCE (Dec. 17), they also note that antibiotic substances have been found in various types of "bug juice" extracted from several insect species by other workers.

The large milkweed bug proved convenient laboratory material for the present research, they state, because it is easily reared in captivity, requiring only a supply of milkweed seed for food and some water to drink.

They suggest that "insects, famous for their hardiness and rapidity of reproduction, may be, directly or indirectly, sources of new antibacterial agents of possible practical value."

Science News Letter, January 1, 1949

WILDLIFE

Airplanes Not Welcome Over National Parks

➤ AIRPLANES are not welcome too low in the air over the National Parks, John D. Coffman, chief forester of the National Park Service, told the Society of American Foresters meeting in Boston. Present recommendations call for them to stay at least 2,000 feet above the ground in and near the parks. This is because it is felt that low-flying planes disrupt the atmosphere of quiet, undisturbed nature which is the chief asset of the National Parks and the principal reason for the coming of the millions of visitors every year.

At the same time, it is recognized that many persons will want to come up to the entrance of the parks by plane, so that the development of airports near the parks is encouraged.

There have been a few bad plane crashes within National Park boundaries, Mr. Coffman stated. In these cases, men of the National Park Service have cooperated to the limit, even at the risk of their own lives. Such crashes, even of small planes, always present the hazard of bad forest fires, he pointed out; it is also quite troublesome, and usually costly, to remove the disfiguring wreckage afterwards.

Science News Letter, January 1, 1949

CE FIELDS

ENGINEERING

New Process Aids Making Tube Faces for Television

➤ A CHEAPER but satisfactory method of making glass face plates for television tubes, which uses a technique in which the material is optically ground and polished while the glass is still flat, was revealed by the Pittsburgh Plate Glass Company.

A newly developed bending process permits the polished glass to be shaped into proper sphericity without marring the precision surface obtained before the blanks are cut to size. The new face plates can now be manufactured on a production line basis, with a great reduction in time.

In the old process, glass blanks were molded to general spherical shape and then put through rigorous optical grinding and polishing operations to obtain perfection. It is a slow process. The new method has already broken the bottleneck in the production of face plates of 5-inch size, and will be used for larger size tube faces as soon as the necessary machinery is installed.

Science News Letter, January 1, 1949

NATURAL RESOURCES

America Faces Challenge To Live Within Own Means

➤ AMERICA faces a challenge to live within its means, in terms of utilization of its natural resources, declared Fairfield Osborn, president of the New York Zoological Society and author of the best-selling conservation book OUR PLUNDERED PLANET (Little, Brown), before the Cooper Union Forum in New York.

We have not been doing so, but instead have been eating up our national capital, the speaker asserted: "Our famed high standard of living has been built to a considerable degree upon consuming our reserves. One wonders why we Americans cling to the illusion—the pap of seekers for political office—that our standard of living is always going up."

We should not count too much on the development of the tropics for a new frontier, either, Mr. Osborn told his audience. In the rainy region south of the Sahara in Africa soil erosion is already a recognized and severe problem. The Amazon basin is a thickly forested wilderness, but it is unsafe to clear it because as soon as the forest cover is removed the diluvial rainfall of the region begins to waste the land. The cost of the development of the tropics presents difficulties.

We must therefore learn to live mainly on our own resources, and to take care of those resources so that they will continue to serve the nation indefinitely. At present, the good, productive land in the United States averages about 3.5 acres per inhabitant. Curiously enough, citizens of the USSR have almost exactly the same number of acres to support each person in that country. It remains to be seen which of the two socio-political systems will prove best in terms of intelligent land use.

Science News Letter, January 1, 1949

ANTHROPOLOGY

Casts of Pygmy Ape-Man's Bones Arrive in U. S.

➤ CASTS OF BONES of a pre-human race of pygmies—natives of South Africa a million years ago—have just been added to the collection of the Smithsonian Institution in Washington. These fire-making, weapon-carrying "ape-men", who may represent the earliest known of man's ancestors, were discovered in the Transvaal by Prof. Raymond A. Dart of the University of Witwatersrand in Johannesburg.

Prof. Dart had the casts specially made for Dr. T. D. Stewart, Smithsonian curator of physical anthropology. They represent the first casts to reach this country.

The long-extinct creature, who weighed from 80 to 100 pounds had a brain comparable in size to that of a gorilla, and showed near-human physical traits, has been given the name of *Australopithecus prometheus*. Although it is not known if the Australopithecus is directly related to man, Prof. Dart believes that his researches show a closer relationship between ourselves and the pygmies than was previously supposed (*See SNL*, Oct. 30, 1948).

Science News Letter, January 1, 1949

VETERINARY MEDICINE

Drug Combination Makes Surgery Painless for Dogs

➤ DOGS can now undergo surgical operations as painlessly as human beings, thanks to a new drug combination developed by a two-man research team in Detroit, Dr. T. F. Reutner, veterinarian, and Dr. O. M. Gruhzit, physician.

The drugs used are methadon, a synthetic pain-killer that takes the place of morphine, and surital sodium, a sleep-inducing compound of the barbiturate series. Anesthesia lasts only about 15 minutes, but this is long enough for ordinary veterinary surgery. Recovery takes place in from three to five hours. There are no unpleasant after-effects, and no apparent tendency to addiction.

The new method is announced in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

Science News Letter, January 1, 1949

CHEMISTRY

DFDT, Cousin of DDT, Even Deadlier to Flies

➤ AN APPLE-scented German cousin of DDT, known as DFDT, proves to be a better killer of houseflies and certain other flying insects than DDT. At the same time DFDT is apparently less toxic to warm-blooded animals and fish, Dr. W. T. Sumerford of the U. S. Public Health Service told members of the American Chemical Society at a regional meeting in Shreveport, La.

The "F" in DFDT stands for fluorine, two atoms of which are substituted for chlorine atoms in the original DDT formula. Spelled out in full, the compound is di-fluoro-diphenyl-trichloro-ethane. It was much used in Germany during the war, but is only now being investigated in this country. Although it kills fewer insect species than DDT, it has quicker knock-down power against the ones it does affect.

Science News Letter, January 1, 1949

BIOCHEMISTRY

Sex Hormone in Grass May Increase Milk Yield

➤ MORE MILK may be produced, thanks to a sex hormone in grass.

A female sex hormone in the fresh young grass that cows eat in springtime may have more to do with the seasonal increase in milk production than the larger quantities of food they eat, as has always been supposed. This suggestion is offered by two cooperating British research teams, in a joint letter to the editor of the journal, NATURE (Nov. 27).

They also suggest that a greater year-round milk yield may be obtained by supplying the hormone artificially to the cows in their off-peak seasons, when spring grass is not naturally available.

In a series of tests, it was found that extra feed did not increase the milk proteins and sugars; neither did the feeding of year-old hay. Feeding on young grasses did produce a noticeable improvement in milk yield.

The various hays and grasses were then subjected to standard hormone-extracting processes, and the extracts were tried on laboratory animals for their potency in producing typical female physiological reactions. The grass extracts produced as great effects as pure female sex hormones, whereas the extracts from year-old hay had no effect whatever.

Participating in this research were S. Bartlett, S. J. Folley and S. J. Rowland of the National Institute for Research in Dairying at Shinfield; and D. H. Curnow and Sylvia A. Simpson of the Courtauld Institute of Biochemistry, Middlesex Hospital, London.

Science News Letter, January 1, 1949

GENERAL SCIENCE

Science Previews for 1949

Cancer test may be found for mass surveys; radioisotopes give promise of better understanding of diseases; new drugs will be sought to conquer infections.

By WATSON DAVIS

➤ WHAT new discoveries and inventions can the world expect in 1949?

Advances are likely in medicine and health.

A new test for cancer may be found that can be used like the X-ray screening for tuberculosis. This would spot cases early when something can be done about them.

Discovery and exploration of physiological and chemical mechanisms through use of radioisotopes give promise of allowing new advances in understanding heart and arterial diseases, arthritis and other ailments.

Mass application should be made of the new preventive and curative measures against venereal disease.

New chemicals for the conquest of infections, possibly those virus-caused, will be sought.

Patients with deep-seated cancer of internal organs will be getting treatment with 20,000,000-volt X-rays. This radiation will come from the high voltage machine, called a betatron, now being adapted for cancer treatment and research. High energy electrons from this machine may themselves be tried for cancer treatment, instead of using them to create X-rays by bombarding a platinum target.

New Elements

In chemistry, there are good chances that new elements will be manufactured. These will be elements 97 and 98, made to order in the atomic piles or cyclotrons. They will be fleeting substances, highly radioactive and not of immediate utility, like the atomic-bomb element, plutonium, also a synthetic element.

In physical and atomic science, there will come new knowledge about the fundamental particles or entities of which the atoms and radiations of the universe are composed. We shall know more about the mysterious mesons, born naturally of cosmic rays, made artificially for the first time in 1948. New kinds are likely to be discovered.

Some more giant atom-smashers, equal in power to the 400,000,000-electron volt machine at Berkeley, at present the world's largest, will be completed and may begin to be used in research.

The world's largest atomic chain-reactor (pile or "furnace") for research purposes will start operation at Brookhaven National Laboratory on Long Island, and will be used to produce radioisotopes with which new knowledge in many fields can be obtained.

Work will be continued on the great problem of photosynthesis. The way in which the green leaf utilizes the energy of the sunshine and makes starches, sugars, cellulose and other plant products is still something that man can not duplicate. Carbon 14 radioisotope and tritium, triple-weight hydrogen, are being used as tracers. The needed clues for the solution of this great problem may be discovered during 1949. Conceivably this may be more important than the discovery of the release of atomic energy and the peace-time use of atomic energy.

Isotopic Research

Isotopes, some of them radioactive and others stable, are being used to attempt solutions of several hundred problems, among them the discovery of the exact mechanism of industrial chemical processes. Out of such work there may come new chemical products and simpler and cheaper ways of making old products.

The great rush to utilize petroleum as a chemical raw material will continue, with new syntheses that will make commercial some materials that have not yet emerged from the laboratory.

In the application of electronics, one or more of the giant electronic computers will probably be completed. Some of them will be available for use upon the results of the 1950 census or earlier trials in population counting. There is hope that such machines can be applied to economic problems of many variables and long and intricate computations.

Weather forecasting may get aid from the development of the speedy and intricate computers, since it would be possible to utilize and evaluate many more pieces of information collected by observers in sufficient time to give forecasts before the weather happens.

A new electronics is in the making through discoveries of semi-conducting properties of metals and compounds. Some important new electronic phenomena of this sort may be expected to bring new applications or better ways of performing old functions. Electronic devices of this new sort, such as the transistor, demonstrated in 1948, may make the present vacuum tubes obsolete for many purposes.

Radio relay circuits will continue to spread farther across the face of the American continent, carrying television, telephone, telegrams, facsimile and radio signals to transmitting stations at well-located points, thus expanding our communication services.

In the detection of infra-red radiation or heat of short wavelength, there will be developed greater sensitivity that will bring new applications in many fields, from medicine to astronomy.

The great 200-inch telescope on Mt. Palomar during 1949 will finish its major adjustments and observe with some effectiveness, but it will take longer than a year in all probability to make any major discoveries with it. The lesser Schmidt-type telescopes are likely to discover a nova or two and add materially to our knowledge of the universe.

Great collections of photographic plates pictures the universe as seen by a dozen or more telescopes through the years. If sufficient money can be found to mine this rich record of the constitution of space, we should be able to learn more about whence the universe came and whither it is going, how big it is and whether it is expanding.

New and better photocells for measuring heat and light from the stars and nebulae

ANCIENT PERSIAN INSCRIPTION—Squeeze paper is shown being applied to a monumental inscription on a mountain cliff in a remote desert fastness of Iran, which was discovered by Richard N. Frye of Harvard University. It is expected to give new information about Zoroastrianism, the religion of ancient Persia.

DETERMINES ENERGY DISTRIBUTION—Shown in place before the 100,000,000-volt betatron in the General Electric Research Laboratory is the gamma ray spectrum analyzer used in studying the radiation from this device. It was developed by Dr. James L. Lawson of G-E as a labor-saving device.

are being devised. These may accelerate the collection of astronomical data and supplement the photographic plate and the human eye in recording telescopic views.

There are no important eclipses on the 1949 calendar, with only two of the moon and two partial ones of the sun.

There is always a chance that there will come into view a very bright comet that will attract wide public attention, although brilliant naked-eye comets have been rare in recent years. Such new comets can not be predicted.

Radar-Tracking

The interest of the military in anything that flies high in the upper atmosphere will accelerate the study of meteors or shooting stars. Much can be learned about conditions high above our heads by radar-tracking these speedy and tiny visitors from outer space.

There will be continued research on guided missiles and rockets, but most of this work is secret and will not be announced at the time it is done. One of the great events in human history will be the flinging of an object outside the gravitational influence of the earth. It is not improbable that an attempt will be made to shoot a small rocket to the moon in the next few years as a test and demonstration, its arrival to be signaled by the flash of an explosion.

With man-carrying planes now admittedly flying faster than the speed of sound, aviation's era of supersonics will undoubtedly continue with continued discoveries and inventions in ultrafast flight, although most of the progress will be hidden by military secrecy.

In commercial aviation, more attention will be paid to the installation of various landing devices using both radio and visual devices that will guide planes to a landing strip under conditions of bad visibility.

There will be a growing realization that the methods of psychiatry and psychology can be used in understanding and remedying the conflicts upon the international scene, just as they have proved useful in personal family and community situations. Application of these ideas may prove of some aid in preventing or postponing war and the conditions that lead to international misunderstanding.

From those who treat the mentally ill there will come new reports of the effectiveness of surgery upon the brain as a treatment in the hands of specialists, while electric shock therapy is likely to be used more discriminatingly and therefore upon fewer patients.

New evidence about man's ancestors may come from two intensive searches now in progress. From South and East Africa there are likely to be new finds that may radically alter our concept of the earliest stages of human development. In America, especially in Alaska, progress should be expected upon the problem of how early man came to this continent and how.

From surveys that archaeologists are making before dams back up water over sites of early Indian habitations, especially in the Missouri Valley, new ideas of pre-Columbian civilization may be obtained.

It may be found that there is more truth than generally credited to the idea that the Vikings discovered and explored America before the time of Columbus. There may be general acceptance of the genuineness of the Viking relics found here and this will cause anthropologists to consider the effect upon the Indians of such an early European contact.

All over the world there is a rising desire for more information and education, with an accent upon the need for more scientific knowledge and investigation. This applies to almost all countries and locations, not just America.

Much knowledge about how human beings learn and how various kinds of abilities can be distinguished and cultivated is about to bear fruit. Such psychological developments could aid industry, and they could extend into the home and school. New methods of infant care and pre-school education will be demonstrated during the coming year.

One of the consequences of the re-election of President Truman will be the probable creation of the National Science Foundation by the next Congress. The beginnings of an expanded research program by the federal government can therefore be expected in 1949.

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GENERAL SCIENCE

Do Not Burden Scientists With Routine, Is Advised

➤ DON'T PRESSURE scientists to produce to order. Don't direct their researches along so-called practical lines. Don't urge them to write reports merely for prestige.

This advice was given by Dr. George W. Morey, Carnegie Institution of Washington scientist, who directed optical glass production in both wars, and who was given the first Arthur L. Day medal by the Geological Society of America in New York.

Such men as the famous lone-wolf researcher, Willard Gibbs of Yale, need only be let alone, afforded every facility they want, and not burdened by administration and organization that they don't want, Dr. Morey declared.

Industrial research, contrasted with creative individual research, can be done, Dr. Morey said, by groups that are charged with systematic attempts to improve processes and products.

Governmental research, now being supported on a large scale financially, may attract "the aggressive personality who sees a golden opportunity for personal aggrandizement," Dr. Morey warned.

Science News Letter, January 1, 1949

FORESTRY

West Pine Yields Pitch

➤ THE Southeastern Atlantic coastal region, long the source of pine pitch for turpentine, rosin and other so-called naval stores, is facing a rival in the Northwest. Millions of stumps of western yellow pine are available there, from which it is now found that pitch for naval stores can be commercially extracted.

This western yellow pine is known to foresters as *Pinus ponderosa*. It is found in the northwestern states and as far south as Arizona. It is a forest tree, attaining an age of from 300 to 500 years, and often reaching a height of over 200 feet, with stumps up to eight feet in diameter. Little if any use has been made of the stumps left after logging, but now they may be pulled and processed to obtain their pitch.

It has been long known that Ponderosa pine stumps contain pitch, but quantity, quality and costs of extracting were uncertain factors. It is now known that the pitch can be extracted commercially. This is a result of work at the Portland, Ore., laboratory of the Western Pine Association, according to American Forest Products Industries, Inc., in Washington. It was found that stumps from trees cut up to four years ago yielded an average of 340 pounds per ton, and older stumps yielded 500 pounds per ton in extracts.

The process for the recovery of the Ponderosa pitch from stumps is similar to that used for the same purpose in southeastern states for some 30 years. The stumps are yanked out of the ground and hauled to the factories. There they are reduced to chips by heavy machinery, and the chips are put in a solvent solution. This liquid absorbs the pitches, but is later easily separated from them. The solvent can be used over and over again.

Big, old Ponderosa stumps have been found best for processing. Their bark and sapwood, neither of which are pitchy, have been weathered away. An average aged Ponderosa pine stump on good growing land weighs a ton or more, and can yield up to 500 pounds of pitch extracts. Any number of old stumps are available in Washington, Oregon, California, Idaho, Montana and other western states. It remains now for the necessary processing factories to be constructed.

Science News Letter, January 1, 1949

PUBLIC HEALTH

Medical Care for All

➤ GOVERNMENT-SUPPORTED medical care for everyone is advocated by the new president of the American Public Health Association, Dr. Charles F. Wilinsky, administrator of Beth Israel Hospital and Deputy Commissioner of Health of Boston.

"The American Public Health Association is earnest in its belief that good health is something that every man, woman, and child has a right to have and to enjoy," he stated in an interview.

Sanitation and the control of communicable diseases have lengthened the life span of the American people. Now, Dr. Wilinsky pointed out, the diseases of middle life and old age, such as cancer and heart disease, are major health problems, and the line between preventive medicine and medical care can no longer be drawn.

No particular plan of government-supported medical care is supported by the association, however, because it does not know which is the best way. The possibilities are social insurance similar to social security, voluntary health insurance by private organizations, support by general taxation both federal and local, or some combination of these. However, its section of medical care, whose organization has just been announced, may well begin a study of the problem.

Any government-supported program must be instituted gradually, it was pointed out, because the United States does not now have enough doctors, nurses and hospitals to give adequate health care to everyone.

As a goal, Dr. Wilinsky suggested an integrated hospital plan similar to the ones recently set up around Boston and Rochester. Small rural hospitals are linked to larger hospitals in small cities which can provide the services of laboratories and pathologists. These hospitals in turn have access to the facilities and specialists of the great teaching hospitals in large cities and universities. There is great need for more rural hospitals in the form of tax-supported public health centers recommended by the American Hospital Association which can combine limited medical care with sanitation and preventive medicine work.

Science News Letter, January 1, 1949

CHEMISTRY

Fire-Extinguisher New Fluid Safe in Ventilated Places

➤ A FIRE-extinguishing vaporizing liquid known as chlorobromomethane, a chemical compound containing chlorine, bromine and methane, is effective and safe to use in well-ventilated places but may be a hazard in closets and small rooms.

This is the conclusion of Underwriters' Laboratories, Inc., sponsored by the National Board of Underwriters. It is based on extensive studies made to determine the life hazards of the fumes evolved by this chemical in contact with flame or hot surfaces under fire conditions likely to be encountered in practice. The complete results are given in a recent bulletin issued in New York by the laboratories.

The chief gaseous decomposition products of chlorobromomethane applied to gasoline, ethyl alcohol and wood fires, and to gas flames, hot iron surfaces and electric arcs, include hydrochloric acid, hydrobromic acid, carbonyl halides, and in some cases free chlorine and bromine. The concentrations obtained depend upon the quantity of chlorobromomethane applied, the fire conditions, and the degree of confinement of the fumes.

The odor of chlorobromomethane resembles that of chloroform and can not be said to give adequate warning of danger. One quart of the chemical on evaporation produces nearly 12 cubic feet of vapor at ordinary room temperature. In a room of 1,000 cubic feet capacity, the resulting concentration of vapor will be in the order of 1.2% by volume. In concentrations of 0.8% to 1% by volume in air the vapor has marked and prolonged anesthetic effects on guinea pigs.

The concentrations of chlorobromomethane vapor resulting from the application of this extinguisher chemical to fires occurring in open places may not endanger life on temporary exposure, the report states, but when used in unventilated places, operators and others should take precautions to avoid the effects which may be caused by breathing the vapor or its decomposition products.

Science News Letter, January 1, 1949

ENTOMOLOGY

DDT and Oil Spray Can End Hazards of Black Flies

➤ A CHEAP and easy way of overcoming the hazards of black flies, which are not only a nuisance to vacationists, sportsmen and hunters but also a source of economic loss to farmers and ranchers at times of flood and high waters, was reported by the Army Medical Department at the meetings in New Orleans of the American Society of Tropical Medicine, National Malaria Society and American Society of Parasitology.

Five dollars' worth of material and a few hours of labor are all that are needed to reduce the black fly hazard on a farm, ranch or plantation.

A man with a two-quart spray gun loaded with DDT and oil may stand on the side of a stream with the wind at his back and spray the surface of the water so that currents will carry the film of

DDT as far as 25 miles downstream. A tenth of a pound of DDT per acre of land is the correct amount to use. Directions for spraying without hazard to fish and other valuable animals can be obtained from the U. S. Department of Agriculture.

DDT was credited by an Army entomologist, Maj. Frederick W. Whittemore, with being the best of currently used agents for protecting wool cloth against damage by moths and other insects.

"This discovery," Maj. Whittemore said, "made by a Department of Agriculture scientist, will mean an inestimable saving to the government in preserving its woolen goods in storage as well as to individuals in civilian life."

Science News Letter, January 1, 1949

PSYCHOLOGY

Women's Fashion Leaders

Paris and New York designers do not have complete power over fashion trends, a recent study has revealed. The average woman seems to have a mind of her own.

➤ PARIS designers and New York modistes may think they lead the fashions, but they actually can lead them only just so far.

Mrs. Main Street puts a very definite limit on the power of the fashion czar. The firmness of the average woman in resisting being pushed too far by either the "New Look" or any other fashion trend is revealed in a study of fashions over a 19-year period.

Styles from *Vogue* and the *Woman's Home Companion* were compared with actual photographs appearing in such magazines as *Review of Reviews, Literary Digest, Outlook-Independent* and *Life,* and showing what actually was being worn. Results are reported by Nancy Koplin Jack and Betty Schiffer of Pennsylvania State College in the AMERICAN SOCIOLOGICAL REVIEW.

In general the study showed for both styles and photographs the same ups and downs of hemline. A lowering of hemline during the depression years of 1929-1932. A low hemline plateau from 1932 to 1936. A gradual rise in hemline up to the 1939 high. A high hemline plateau 1939-1942. Here the natural course of fashion was interrupted by Government order L-85 which limited the use of material in ladies' long skirts. But then came a drop in the hemline from 1945 to 1947.

When hemlines drop, they go down faster in the fashion magazines than on the streets. But when they go up it is the average woman who leads the leaders but she doesn't go as far. During the late 30's and early 40's she was wearing her skirts just a little longer than was being prescribed by the fashion magazine.

The more extreme the dictated hemline, the greater the non-conformity of the average woman, it was found. But if the designers kept within limits, she follows readily enough.

The woman five feet six inches tall prefers a length roughly 14 inches from the floor. The woman five feet tall prefers to have her skirts only 12 inches from the ground. This means, the investigators point out, that the hem height most preferred is just about one fourth of the distance from the floor to the V of the neck.

The investigators ran into a surprise in the course of their study. They had originally selected *Vogue* as representing the extreme of fashion and the *Woman's Home Companion* as being a mid-point between those styles and the taste of the ordinary woman. It turned out to be the other way around. The WHC is more extreme than *Vogue*. And their styles change more precipitately than do those of *Vogue*.

Science News Letter, January 1, 1949

FORESTRY

Air Photographs Valuable In Studying Timber Areas

➤ AIR photographs are of great value in sizing up the commercial timber possibilities of an area, Karl E. Moessner of the Central States Forest Experiment Station told the meeting in Boston of the Society of American Foresters. They not only show what kinds of trees are present, and in what sizes and numbers, but also indicate to the properly trained eye the height and steepness of the hills and the general character of the soil.

One thing that has to be taken into account in interpreting air photographs, Mr. Moessner pointed out, is the greatly exaggerated heights given to all objects by the stereoscopic air camera. This exaggeration can, however, be turned to real advantage in identifying trees and studying slopes, once it is properly allowed for.

Science News Letter, January 1, 1949

MEDICINE

Warn Against Blind Use of Penicillin for Colds

➤ A NEW REASON why your doctor may not prescribe penicillin for every cold or sore throat you have this winter appears in a report by Drs. Jay Ward Smith and Arthur L. Bloomfield of Stanford University Medical School.

Penicillin, they find, produces a profound change in the bacterial "balance of power" in human throats. Upsetting this balance by driving out some bacteria with penicillin may give new and perhaps harmful ones the ascendancy. The sore throat germ might be banished only to let some more harmful one have a chance to prey on the patient.

"Our findings support the position that it may be unwise to give penicillin blindly to every patient with a sore throat or a cold," the Stanford physicians warn.

It might be better, they suggest, to give penicillin only after cultures show the presence of a disease-causing germ which seems to be playing an active part in the disease the patient has.

Science News Letter, January 1, 1949

PUBLIC HEALTH

Fight Against Flu Part Of World-Wide Program

➤ A PLAN aimed at preventing recurrence in this country of a serious epidemic of influenza like that of 1918 has been developed by the Surgeons General of the Army, Navy, Air Force, and Public Health Service.

The plan is part of an international program set up by the World Health Organization last year to study influenza and to aid physicians and health officials in the control of the disease. An Influenza Information Center to serve as headquarters for the program in the United States has been established at the National Institutes of Health, Bethesda, Md.

The specific objectives of the worldwide program are (1) to identify new strains of influenza virus as these appear and (2) to evaluate their usefulness for incorporation into influenza vaccine.

Prompt reporting by local physicians and health officers of all suspected cases of influenza is essential to the success of the program, because of the explosive character of most influenza epidemics and their exceedingly rapid spread over extensive areas.

The program will operate as follows in the United States:

As soon as a significant outbreak of respiratory disease suspected to be influenza has been reported in a given community, the Influenza Information Center will alert diagnostic laboratories in the region, asking them to carry out serological tests on patients for the presence of antibody against the influenza virus. Certain laboratories will also be asked to assign to the affected community a team of investigators experienced in the techniques of isolating the virus.

As soon as these investigators have isolated a new strain of virus, they will send it at once for a complete antigenic analysis to the Strain Study Center of the Influenza Commission, Army Epidemiological Board at Long Island College of Medicine, Brooklyn, N. Y. Appropriate strains of the virus which have been isolated will be considered for possible inclusion in commercial vaccine.

Science News Letter, January 1, 1949

BOTANY

NATURE RAMBLINGS

by Frank Thone

Life Everlasting

➤ THE theme of resurrection, of life renewed and triumphant over death, is customarily thought of as something connected with Eastertide and springtime. Yet it is not inappropriate to think of these things now, as the Yule season closes and the new year begins. For although we still have the worst of the winter's storms to live through there is already a promise of brighter things to come, a prophecy of young leaves and petals bursting from their still-sealed buds.

The midwinter feasts of Christendom are actually older than the Christian events they traditionally commemorate. For in most of the ancient pagan lands, men took a week or two off in midwinter to feast and sing songs in celebration of the return of longer days and the beginning of the sun's return from his long and disheartening winter retreat. Use of green boughs and bright berries, of such things as pine branches and holly, were expressions of man's invincible hopefulness in the face of the most desperate-seeming situations. These things that kept the look of life about them, when everything else in the woods seemed dead, were to our ancestors bright banners of hope in their gropings towards immortality.

With our better knowledge of the actual winter state of trees and shrubs and lesser plants, we are well aware that they are not dead but sleeping. When new warmth comes back to the cold earth, along with the days that have already begun to lengthen a little, the weeks after spring equinox will make good the promise of the days after winter solstice, and life will break through the long bonds of dormancy.

But even where death has been real and not seeming, as with the fallen leaves and snapped-off branches, there will be an arising of new life out of the death of the old. All these myriad discarded bits of once-living material, worked over by swarming organisms of decay, leave a richer earth out of which the new generations of leaves and flowers and eventual fruit can draw the most necessary elements of life. Death and decay are indispensable links in the endless chain of living.

Science News Letter, January 1, 1949

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AERONAUTICS

Developments in Aviation

➤ YEARS of work in aviation developments reached the application stage during 1948, the 44th year of the flying age following the December day in 1903 when the Wright Brothers proved that man-carrying, engine-driven, winged aircraft could actually fly.

Some of these developments are in relation to the plane itself, and have to do with such items as speed, range, safety, comfort and size. Others of equal, if not greater importance, are concerned with navigation, take-offs and landings. Aeronautics is fast reaching the stage where all-weather flying will become as general as railroading.

Many speed records were broken during the year, but these are the culmination of years of work of scientists and engineers. They are the results of a pooling of knowledge acquired by governmental and industrial researchers into the fundamentals of aerodynamics.

Among these speed accomplishments was the establishment of a new official world record of practically 671 miles an hour by a U. S. Air Force jet plane, a North American F-86. Far greater speeds were obtained, all unofficial from the international standpoint, several times by the Air Force, Bell Aircraft XS-1, which actually made its first supersonic flight in the fall of 1947.

Important achievements were made in long-range flights also. Long range ability is important in both commercial and military flying, particularly in international and transoceanic flying. A 6,000-mile non-stop test flight made by the Air Force giant bomber, the Consolidated-Vultee B-36, which took off with a gross weight of 300,000 pounds, is noteworthy.

A 3,400-mile non-stop flight of the jet-propelled Northrop Flying Wing bomber was a striking demonstration of the progress made in jet propulsion, and also of the future possibilities of the flying wing type of aircraft. This ship combines speed with long range; it is in the 500-mile-an-hour class, and can carry 15 tons of bombs.

In commercial flying, scheduled flights will be more dependable, certain and safe with new navigation aides installed during the year that will permit flying in weather in which all planes were grounded in the past. The successful application of very high frequency (VHF) radio communication between planes in the air and ground control stations is largely responsible. This type of static-free communication permits a pilot to hear clearly instructions from the ground, and it is also used in the new so-called omniranges which will furnish the radio beams for pilots to fly in the future. Some of the radio ranges are already using VHF; all will be soon, and the United States will have some 400 of these stations. Their beams will reach every part of the country. They are called omniranges because they send out pilot-guiding beams in all directions, rather than in only four as provided by the radio ranges of the past.

The Civil Aeronautics Administration so-called instrument landing system (ILS) has been widely extended during the year, and hundreds of transports have been equipped with the necessary apparatus to make use of them. CAA installs the necessary airport equipment; plane operators must install their own airborne equipment.

To supplement the ILS, a number of commercial airports now have an improved form of the wartime radar-radio ground controlled approach equipment known as GCA. One radar scanning equipment locates every plane in the air within some 30 to 40 miles of the instrument, even in the worst of weather. Another radar set is used to follow a particular plane about to land, to give the pilot voice instruction by radio. This radar enables the ground operator to see whether the plane is making the proper approach and is directly on the ILS radio beam glide path.

Very important during the year was the study of aviation navigation made by a national committee known as the Radio Technical Commission for Aeronautics. It is made up of experts in aviation, both in navigation and in manufacturing. Its recommendations will soon be in standard use.

Most important of these is the development of what is called a common system for the navigation control of both civil and military planes. Its recommendations include general use of instrument landing systems of the CAA type, the use of GCA where needed, the omniranges now being set up throughout the nation, and special airborne equipment including omnirange receivers, two-way VHF radio voice communication, and another ingenious instrument that tells a pilot in miles the distance from him to the station on which his instrument is tuned.

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Books of the Week

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AUREOMYCIN—A NEW ANTIBIOTIC—B. M. Duggar and others—*New York Academy of Sciences*, 168 p., illus., paper, $2.50. Sixteen articles originally presented at a conference in July, 1948, to discuss this important new medical weapon.

THE CERAMIC VOCABULARY OF THE OLD TESTAMENT—James L. Kelso—*American Schools of Oriental Research*, 48 p., illus., paper, $1.25. Not a dictionary, but a discussion of technical terms appearing in the Bible from the point of view of both the ceramist and the archaeologist. Clay was used not only for dishes and bricks, but as a writing material, for religious objects, smelting furnaces, and in other important ways.

CHAMBERS'S TECHNICAL DICTIONARY: Comprising Terms Used in Pure and Applied Science, Medicine, the Chief Manufacturing Industries, Engineering, Construction, the Mechanic Trades—C. F. Tweney and L. E. C. Hughes, Eds.—*Macmillan*, rev. ed., 976 p., $6.50. A convenient reference book of British origin. Includes chemical formula.

CHEAPER BY THE DOZEN—Frank B. Gilbreth, Jr., and Ernestine Gilbreth Carey—*Crowell*, 237 p., illus., $3.00. The gaily written biography of the inventor of "motion study" and his large family of lively children who also served as subjects for his experiments. The authors are two of the dozen.

HOW TO LIVE LONGER—Justus J. Schifferes—*Dutton*, 255 p., $3.00. The author tries to tell you what you can do to outwit the ten principal causes of death.

THE WAR LORDS OF WASHINGTON—Bruce Catton—*Harcourt, Brace*, 313 p., $3.00. The story of the great psychological effort of organizing the nation for war production and of the many battles of Washington as seen by a journalist who was in the thick of it.

Science News Letter, January 1, 1949

ENTOMOLOGY

New Insect Emigrants

NEW INSECTS in this country are both good and bad news, American scientists were informed in the journal SCIENCE Nov. 26).

Metoponia rubriceps is not good and may be bad.

Microtonus aethiops and *Campogaster exigua* are definitely fine.

Metoponia rubriceps was discovered on a lawn near San Francisco's Golden Gate Park by Dr. Edward L. Kessel, professor of biology at the University of San Francisco. They were identified by Dr. Maurice T. James, entomologist at the State College of Washington, as being Australian sod flies, probably the first found in the New World. Other specimens of the new-to-the-U. S. fly species have since been discovered in and near the park.

These flies do not do much damage in Australia, but Dr. Kessel points out that they might in this country. He explains that in California the flies may be away from natural enemies, and this situation would make them more dangerous here.

M. aethiops and *C. exigua* were brought to this country from France to help protect sweet clover. These French insects are parasites that live on the sweet clover weevil. They were obtained by the North Dakota Agricultural Experiment Station through the cooperation of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, explain A. A. Munro and R. L. Post of the experiment station in Fargo.

The weevil has been doing extensive damage to U. S. and Canadian sweet clover since it first appeared in Canada in 1924. But even after 24 annual generations, the weevil seemed to recognize its parasite enemies, the North Dakota scientists reported.

One of the parasites was seen to "stalk" a "frantically retreating" weevil for a distance of 30 inches, they said. The parasite was finally triumphant and planted an egg in the body of the weevil.

This life-or-death race and other studies indicate that the parasites may become an important weapon against the weevil menace to an important pasture and soil-building crop.

Science News Letter, January 1, 1949

GENERAL SCIENCE

Free Research Will Beat Soviet Science, Bush Says

SCIENCE on this side of the iron curtain will outdistance Soviet science based on the ideologies of Marx and Lenin, Dr. Vannevar Bush, president of the Carnegie Institution of Washington, predicted in his annual report.

Genetics of the communist variety, which teaches that those who utilize the Mendelian laws of inheritance are enemies of the state, Dr. Bush said, will become ultimately a grotesque collection of folklore and superstitions.

The fallacies of Soviet science, he said, "will gradually be so apparent to all as to force a revision in any situation where men's minds are still capable of the ordinary processes of human logic."

Freedom of science as practiced in the western world was defined by Dr. Bush as:

"Progress in the pursuit of knowledge is made rapidly and securely only when any hypothesis whatever may be entertained by individuals. The survival of hypotheses should be determined only by the rigor of test against cold facts and by the consequent mass of scientific support or denial, untrammeled by any arbitrary rulings from above."

Dr. Bush explained that in the extensive and far-flung research of the Carnegie Institution of Washington the free play of the scientific initiative of the staff is never circumscribed by preconceived notions on the part of the trustees or the president.

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ENGINEERING

Silica Substance Promises To Replace Frosted Bulbs

A SILICA substance which acts as a nearly perfect diffuser of light gives promise of making the present inside-frosted electric incandescent bulb obsolete. It is said to give results superior to the diffusion from regular inside-frosted lamps without diminishing lighting efficiency.

The new development is a product of the General Electric lamp laboratory in Cleveland, and is credited to Marvin Pipkin who played an important part in the development of frosted bulbs nearly a quarter of a century ago. The new inside finish is being introduced in three new lamp bulbs, a 100-watt lamp, a 100-200-300-watt three-lite lamp, and a 150-watt lamp.

Science News Letter, January 1, 1949

CHEMISTRY

Crystal Used in Detection Is Produced in Pure Form

A CHEMICAL crystal with an important application in the detection and measurement of radioactivity, known as calcium tungstate, is now being produced in water-white pure form, the Linde Air Products Company of New York has revealed. Calcium tungstate, a fluorescent compound containing calcium, tungsten and oxygen, is widely used in the manufacture of luminous paints and in screens in X-ray fluoroscopy.

Single crystals of pure calcium tungstate are being "grown" in rods about one-eighth inch in cross section and up to two inches in length, a company official stated. Representative samples of the crystals are colorless, and clarity varies from a transparent to a slightly cloudy product. At the present time, these synthetic crystals are available in research quantities.

Science News Letter, January 1, 1949

• New Machines and Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 446. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *CONVERTIBLE SKATE, recently patented, has a footplate to which wheel trucks for roller skating, or a blade for ice skating, can be quickly attached. With the present high cost of shoe skates, this device lessens expense by making only one pair of shoes necessary.*

Science News Letter, January 1, 1949

⚙ *PERFUME MEASURE, adaptable to volume measurement of any liquid, is designed to measure exactly one dram full measure. Its measuring chamber, into which liquid is sucked by a rubber bulb, has a pick-up tube extending below, whose top projects inside just far enough to hold one dram in the chamber.*

Science News Letter, January 1, 1949

⚙ *COLORED LIGHT, for showcases and other applications, is obtained by a clip that fits over ordinary spotlight reflector lamps, and holds any one of 17 different colored filters. The interchangeable filters are made in four parts to allow for heat expansion and heat escape.*

Science News Letter, January 1, 1949

⚙ *KITCHEN MITTS, usable in household chores including dish-washing as shown in the picture, give the hands complete protection and complete freedom of*

action. They are made of a transparent light-weight, durable, flexible plastic, which is unaffected by grease, acids or stains.

Science News Letter, January 1, 1949

⚙ *CLOTHESLINE TIGHTENER is a cadmium-plated, zinc-alloy device about two inches long with an opening on one end to slip over the post hook. The line, without knotting, is passed through an opening at the other end, where it is grasped by a notched lever which can be "pumped" to remove all slack.*

Science News Letter, January 1, 1949

⚙ *CLOSET SPACE saver is a hinged arm, to hold a dozen dress hangers, which can be turned upward with a push from one hand to bring the clothes close together without crushing and wrinkling. It can be easily attached to any wall.*

Science News Letter, January 1, 1949

⚙ *AUTOMOBILE LAMP tester, for use in service stations and salesrooms, has a six-volt transformer and five sizes of outlets which enable it to be used for checking the entire line of automobile lamps from the tiny instrument panel bulb to the sealed beam headlamp and the automotive spotlight.*

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⚙ *AUTOMOBILE WASHER uses a portable tank and a method of feeding either wash solution or rinse water through a hose to a rotating scrub brush which is held by the hand. The tank, which increases the pressure of the city water supply, also provides the power to cause the brush to rotate.*

Science News Letter, January 1, 1949

• *Do You Know?* •

Cooking utensils were the first major use of *aluminum*.

There are 6,324 *airports* in the United States, of which 403 are military.

Silicone paint is used with a high degree of success to prevent smokestack corrosion.

Silicones, produced from organic matter and sand, were first accepted industrially because of their exceptional heat stability.

Black walnut trees do not injure potatoes, tomatoes and other crops grown under them as many believe; recent scientific tests made by the government clear the nut trees of the bad reputation.

A 50-kilowatt FM (Frequency Modulation) radio broadcast *transmitter* recently installed near Milwaukee is affording excellent reception to listeners within a radius of 105 miles, it is claimed.

The Mexican desert *jojoba* is suggested as a commercial crop in the American arid southwest; this four-foot shrub bears a valuable bean which contains a remarkable wax suitable for many uses.

Fume-proof paints owe their name to the fact that they contain no pigments that form dark-colored sulfides in the presence of sulfur gases; they usually contain titanium dioxide and zinc oxide.

When cabbage is made into *sauerkraut*, the salt sprinkled on the shredded cabbage draws out sugar which is turned to acid and other by-products by the bacteria, yeasts and molds which are usually plentiful on the cut shreds.

Foot defects are more common among women than men if conditions among students in one college are general; in this institution 12% of the men had foot defects and 29% of the women, recent physical examinations showed.

What are called *"hard" seeds*, common in alfalfa, clover, vetch and similar seed stock, do not germinate when first sown but may lie dormant for years; they often germinate later when the land has been planted to another type of crop.

Locust and Kentucky coffee trees belong to the *legume family*, along with peas, beans and clover.

Bituminous coal and lignite production in the United States during 1947 was 10,000,000 tons greater than ever before.

Science News Letter, January 1, 1949

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